



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,682	02/27/2004	Hong Wan	H0004710-1600	9346
128	7590	10/28/2005	EXAMINER	
HONEYWELL INTERNATIONAL INC.			WHITTINGTON, KENNETH	
101 COLUMBIA ROAD			ART UNIT	
P O BOX 2245			PAPER NUMBER	
MORRISTOWN, NJ 07962-2245			2862	

DATE MAILED: 10/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

EK

Office Action Summary	Application No. 10/789,682	Applicant(s) WAN ET AL.	
	Examiner Kenneth J. Whittington	Art Unit 2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-16 is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-11, 17-22 and 26-31 is/are rejected.
- 7) ☒ Claim(s) 6, 7, 12 and 23-25 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.



Bot Ledynh
Primary Examiner

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6/25/04, 8/1/05</u> . | 6) <input type="checkbox"/> Other: ____. |

Art Unit: 2862

DETAILED ACTION

Abstract

Applicant is reminded of the proper language and format for an abstract of the disclosure.

6 The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

18 The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

24 The abstract of the disclosure is objected to because it contains terms that can be implied, i.e., "are provided" in line 1. Correction is required. See MPEP § 608.01(b).

Specification

30 The disclosure is objected to because of the following informalities: throughout the specification, for example, in paragraphs 0029 and 0034, the specification refers to FIGS. 2A, 2B, 3(A) and 3(B); however, there are no such figures, only FIGS. 2 and 3. Amending the language along the lines such that it states section A or B of FIG. 2 and section A or B of FIG. 3

Art Unit: 2862

would overcome this objection. Appropriate correction is required.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

Claim 4 is objected to because of the following informalities: "on the of the" should be amended to "on the" in line 1.

Claim 6 is objected to because it reintroduces "a horizontal sensor circuit component". Simply changing "a" to "the" would overcome the objection.

Claim 11 is objected to because it reintroduces "a vertical sensor circuit component interface edge. Simply changing "a" to "the" would overcome the objection.

Claim 17 is objected to because on line 11, "the magnetic field sensing circuit component" lacks antecedent basis. The claim requires one or more but does not identify which is "the" component. Amending this claim such to read "at least one

Art Unit: 2862

magnetic field sensing circuit component" or along such lines would overcome the objection.

Appropriate corrections are required.

Claim Rejections - 35 USC § 102

6 The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

12 (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

18 (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

24 Claims 1, 4, 5, 8, 9 and 11 are rejected under 35

U.S.C. 102(b) as being anticipated by Widdershoven et al. (US 5,689,185), hereinafter Widdershoven. Regarding claim 1, Widdershoven discloses a miniature magnetic field sensor comprising:

30 a vertical sensor circuit component comprising a first face, a second face, a bottom edge, a top edge, two side edges, input/output pads and at least one sensitive direction wherein

Art Unit: 2862

the I/O pads are arranged on the second face of the vertical sensor circuit component (See Widdershoven FIGS. 1 and 3, item 1 or 1b);

6 a horizontal sensor circuit component comprising a top face, a printed circuit board mounting face, a vertical sensor circuit component interface edge, at least two or more other edges, and at least one sensitive direction orthogonal to the sensitive directions of the vertical sensor circuit component (See FIG. 3, item 1a),

12 wherein the vertical sensor circuit component interface edge of the horizontal sensor circuit component connectively supports the vertical sensor circuit component along the Z axis (See FIG. 3 and col. 4, line 61 to col. 5, line 32).

Regarding claim 4, Widdershoven discloses the input/output pads are arranged in a linear array (See FIG. 1).

Regarding claim 5, the pads of Widdershoven are compatible with one or more the recited methods (See FIG. 1).

18 Regarding claims 8, 9 and 11, the sensors of Widdershoven are magneto-resistive sensors, which are sensors, magnetic sensors and solid state sensors (See FIG. 1 and col. 3, line 66 to col. 4, line 24).

Art Unit: 2862

Claims 1 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Chiku et al. (US 3,304,787), hereinafter Chiku. Regarding these claims, Chiku discloses a tilt or acceleration sensor comprising:

6 a vertical sensor circuit component comprising a first face, a second face, a bottom edge, a top edge, two side edges, input/output pads and at least one sensitive direction wherein the I/O pads are arranged on the second face of the vertical sensor circuit component (See Chiku FIG. 4, one of tilt or acceleration sensor components, i.e., x comprising parts 23x, 24x and 25x);

12 a horizontal sensor circuit component comprising a top face, a printed circuit board mounting face, a vertical sensor circuit component interface edge, at least two or more other edges, and at least one sensitive direction orthogonal to the sensitive directions of the vertical sensor circuit component (See FIG. 4, see other sensor components y or z),

18 wherein the vertical sensor circuit component interface edge of the horizontal sensor circuit component connectively supports the vertical sensor circuit component along the Z axis (See FIG. 4, note each sensor components is attached into the prism shape).

Claims 17-20 and 26 rejected under 35 U.S.C. 102(e) as being anticipated by Beichler et al. (US 2005/0017714), hereinafter Beichler. Regarding claims 17 and 26, Beichler discloses method for making a multi-axis magnetometer for measuring the magnetic field intensity along at least two
6 orthogonal axes comprising:

mounting one or more magnetic field sensing circuit components comprising a top face, a PCB mounting face, a vertical magnetic sensor circuit component interface edge, and two or more other edges, by their PCB mounting face to a PCB (See Beichler FIG. 5, note two of the tube and sensor
12 combinations can each be a component having various surfaces);
and

mounting to the PCB a vertical magnetic sensor circuit component comprising a first face, a second face, a bottom edge, a top edge, two side edges, input/output pads and at least one sensitive direction wherein the I/O pads are arranged on the
18 second face of the vertical sensor circuit component (See FIG. 5, note one of the tube and sensor combinations can be a third component, also note that the sensor can be oriented so that any one of the three components can be vertical);

wherein the vertical magnetic sensor circuit component is attached to and supported by the magnetic field sensing circuit

Art Unit: 2862

component (See FIG. 5, note the single piece component combination).

Regarding claims 18 and 19, the apparatus of Beichler can be rotated such that two sensor components can be horizontal while the third can be vertical (See FIG. 5).

6 Regarding claim 20, Beichler discloses the components non-conductively connected together (See paragraph 0032).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this

12 Office action:

18 (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

24 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

Art Unit: 2862

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Widdershoven. Regarding these claims,

6 Widdershoven teaches all the features of the claims except for the recited dimensions. However, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably
12 distinct from the prior art device. See *In Gardner v. TEC Systems, Inc.*, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 225 USPQ 232 (1984). Because Widdershoven teaches the features of the claims and would not perform differently, the claimed apparatus having the recited dimensions is not patentably
18 magnetic fields and one having ordinary skill in the art would have been motivated to modify the apparatus to the recited dimensions in order to make the apparatus smaller.

Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beichler in view of Chiku. Regarding
24 these claims, Beichler teaches the features as outlined above,

Art Unit: 2862

except for connecting the components together with a non-conductive adhesive. Chiku teaches connecting and orienting several sensor components together into a multi-axis sensor using a non-conductive adhesive (See Chiku FIG. 7 and col. 10, lines 5-53). It would have been obvious at the time the

6 invention was made to dispense with the support member as taught by Beichler and adhesively bond the sensor elements together as taught by Chiku. One having ordinary skill in the art would have been motivated to do so because as noted by Chiku, each method can be used as an equivalent in the art for mounting sensors (See same paragraphs of Chiku).

12

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beichler in view of Hsu et al. (US 6,243,660), hereinafter Hsu. Regarding this claim, Beichler teaches all the features except for the use of a tilt sensor. Hsu teaches using a tilt sensor in conjunction with a magnetometer (See Hsu at 18 col. 3, lines 1-53). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate a tilt sensor in conjunction with the magnetometer taught in Beichler in order to properly orient the magnetometer for magnetic field measurements (See Hsu same portion).

Art Unit: 2862

Claims 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beichler or Beichler in view of Hsu.

Regarding these claims, Beichler or Beichler in view of Hsu teaches all the features of the claims except for the recited dimensions. However, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. See *In Gardner v. TEC Systems, Inc.*, 220 USPQ

777 (Fed. Cir. 1984), cert. denied, 225 USPQ 232 (1984).

Because Beichler or Beichler in view of Hsu teaches the features of the claims and would not perform differently, the claimed apparatus having the recited dimensions is not patentably distinct from these apparatus for measuring magnetic fields and one having ordinary skill in the art would have been motivated to modify the apparatus to the recited dimensions in order to make the apparatus smaller.

Allowable Subject Matter

Claims 13-16 are allowed.

Art Unit: 2862

The following is an examiner's statement of reasons for allowance:

Regarding claim 13, the prior art does not disclose a vertical sensor component having a bottom edge attached to the PCB and a second face with input/output pads, which is also
6 connected to a horizontal sensor component connected to the PCB. Claims 14-16 are allowed for the same reasons therefor.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on
12 Statement of Reasons for Allowance."

Claims 6, 7, 12 and 23-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

18 The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 6, the prior art does not disclose I/O pads for connection to the horizontal circuit component, in combination with the other features of the claims. Claim 7 has

Art Unit: 2862

allowable subject matter for the same reasons therefor based on its dependency.

Regarding claims 12 and 23, the prior art does not disclose conductively connecting the vertical component to the horizontal or magnetic components, in combination with the other features of the respective claims. Claims 24 and 25 have allowable subject matter for the same reasons therefor based on their dependency to claim 23.

Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited prior art discloses various arrangements for magnetometers and other devices having features similar to the claimed invention.

Conclusion

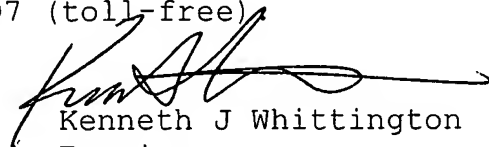
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J. Whittington whose telephone number is (571) 272-2264. The examiner can normally be reached on Monday-Friday, 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be

Art Unit: 2862

reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free)



Kenneth J Whittington
Examiner
Art Unit 2862

kjw